

REPORT

ON THE

COTTON PRODUCTION OF THE STATE OF VIRGINIA,

WITH A BRIEF DISCUSSION OF

THE GENERAL AGRICULTURAL FEATURES OF THE STATE.

BY

W. C. KERR, PH. D.,

STATE GEOLOGIST OF NORTH CAROLINA,

SPECIAL AGENT.

TABLE OF CONTENTS.

LETTERS OF TRANSMITTAL	Page. v
TABULATED RESULTS OF THE ENUMERATION	1-3
TABLE I.—Area, Population, Tilled Land, and Cotton Production	3
TABLE II.—Acreage and Production of Leading Crops	3
PART I.	
PHYSICO-GEOGRAPHICAL AND AGRICULTURAL DESCRIPTION OF THE STATE OF VIRGINIA	5-10
Outlines of the Physico-Geographical Features of the State	7-10
Topography	7, 8
Climate	8
Geology	8
Agricultural Regions	8
The Tide-Water Region	8, 9
The Alluvial or Sea-board Region	8, 9
Sandy Oak and Pine Ridges	9
The Oak Uplands Region	9
The Transmontane and Valley Region	9
REMARKS ON COTTON PRODUCTION IN THE STATE	10
TABLE III.—Population and Cotton Production in each Agricultural Region of the State	10
TABLE IV.—“Banner Counties” as Regards Total Production and Product Per Acre in each Agricultural Region	10
PART II.	
AGRICULTURAL DESCRIPTIONS OF THE COTTON-GROWING COUNTIES OF THE STATE	11-15
Tide-Water or Alluvial Region	12-15
Oak Uplands Region	15
PART III.	
CULTURAL AND ECONOMIC DETAILS OF COTTON PRODUCTION	17-21
Reference Table of Reports Received from the Counties of Virginia	18
Summary of Answers to Schedule Questions	19-21
Tillage, Improvement, etc.	19
Planting and Cultivation of Cotton	19, 20
Ginning, Baling, and Shipping	20
Diseases, Insect Enemies, etc.	20
Labor and System of Farming	21

LETTERS OF TRANSMITTAL.

BERKELEY, CALIFORNIA, June 1, 1883.

To the SUPERINTENDENT OF CENSUS.

DEAR SIR: I transmit herewith a report, by Professor W. C. Kerr, on cotton production in the state of Virginia, with a description of the agricultural features of the cotton-growing counties, a corresponding map of the same being attached to that of the state of North Carolina.

In the case of Virginia, as in that of the other border states, the cotton-growing area seems to be in process of concentration upon the lands where climate and soil concur in rendering possible the competition with the cotton states proper. Hence it has not been deemed important to include the whole of the state in the agricultural description in connection with the subject-matter of these reports.

Very respectfully,

E. W. HILGARD,
Special Agent in charge of Cotton Production.

Dr. EUGENE W. HILGARD,
Special Agent in charge of Cotton Culture.

DEAR SIR: I have the honor to transmit herewith my report on the cotton production of Virginia. I have followed your Louisiana report in the general plan, modifying it only so far as seemed to be demanded by the fact that only a small part of the state of Virginia produces cotton. I have given—

1. Tables of acreage and production of leading crops.
2. A description of the physical geography.
3. A description of the agricultural regions.
4. A general discussion of cotton production in the state.
5. Description of the cotton-growing counties in the several agricultural regions, with abstracts of the schedules of cotton production in the several counties from which such reports were received.
6. Abstracts of the schedule answers to questions regarding methods of cultivation, markets, etc.

The sources of information for this paper are: First, personal observations in most of the cotton-growing counties and in various parts of the state; second, and chiefly, Hotchkiss' *Virginia: A Geographical and Political Summary*; third (for climate in part), publications of the United States signal service.

Yours, very respectfully,

W. C. KERR.

TABULATED RESULTS OF THE ENUMERATION

IN THE

COTTON-GROWING COUNTIES OF VIRGINIA.

TABLE I.—AREA, POPULATION, TILLED LAND, AND COTTON PRODUCTION.
TABLE II.—ACREAGE AND PRODUCTION OF LEADING CROPS..

TABULATED RESULTS OF THE ENUMERATION

3

TABLE I.—AREA, POPULATION, TILLED LAND, AND COTTON PRODUCTION.

Counties.	Area.	POPULATION.						TILLED LAND.			COTTON PRODUCTION.					Cotton acreage per square mile.
		Total.	Male.	Female.	White.	Colored.	Average per square mile.	Acres.	Per cent in cotton.	Per cent of county area.	Acres.	Bales, 475 lbs.	AVERAGE PER ACRE.			
													Bales.	Seed cotton.	Lint.	
	Sq. mls.												Lbs.	Lbs.		
Total for the State.....	40, 125	1, 512, 565	745, 589	766, 976	880, 858	631, 707	38	7, 358, 030	0. 61	28. 65	45, 040	19, 595	0. 44	621	207	1. 12
Total for cotton counties.	4, 420	157, 699	77, 505	80, 184	63, 668	94, 036	30	773, 611	5. 82	27. 35	45, 040	19, 595	0. 44	621	207	10. 19
TIDE-WATER REGION.																
King and Queen	360	10, 502	5, 059	5, 443	4, 424	6, 078	29	91, 086	0. 09	30. 59	80	20	0. 25	357	110	0. 22
Prince George	300	10, 054	5, 098	4, 956	3, 255	6, 799	34	50, 243	3. 21	30. 86	1, 000	700	0. 37	525	175	6. 33
Sussex	400	10, 062	5, 074	4, 988	3, 361	6, 701	25	54, 989	8. 73	21. 48	4, 800	1, 950	0. 41	579	193	12. 00
Isle of Wight	290	10, 572	5, 449	5, 123	6, 010	4, 562	36	50, 756	1. 67	27. 35	850	400	0. 47	672	224	2. 93
Nansemond	400	15, 903	8, 062	7, 841	7, 728	8, 175	40	57, 651	3. 40	22. 52	1, 900	800	0. 41	582	194	4. 90
Southampton	610	18, 012	8, 995	9, 017	7, 447	10, 565	30	107, 269	10. 72	27. 48	11, 500	5, 260	0. 45	645	215	18. 85
Greenville	330	8, 407	4, 232	4, 175	2, 757	5, 650	25	42, 556	19. 97	20. 15	8, 500	4, 100	0. 48	687	229	25. 76
Total	2, 690	83, 512	41, 969	41, 543	34, 982	48, 580	31	463, 550	6. 38	26. 93	20, 560	13, 170	0. 45	633	211	11. 09
OAK UPLANDS REGION.																
Dinwiddie	540	32, 870	15, 484	17, 886	14, 437	18, 433	61	85, 408	7. 61	24. 71	6, 500	2, 500	0. 38	549	183	12. 04
Mecklenburg	610	24, 610	11, 779	12, 831	8, 222	16, 388	40	127, 922	1. 63	32. 77	2, 150	975	0. 45	645	215	3. 52
Brunswick	580	16, 707	8, 333	8, 374	6, 022	10, 685	29	96, 731	7. 03	26. 06	6, 800	2, 950	0. 43	618	206	11. 72
Total	1, 730	74, 187	35, 596	38, 591	28, 681	45, 500	43	310, 061	4. 98	28. 00	15, 450	6, 425	0. 42	594	198	8. 93

TABLE II.—ACREAGE AND PRODUCTION OF LEADING CROPS.

Counties.	COTTON.		TOBACCO.		CORN.		POTATOES.		OATS.		WHEAT.	
	Acres.	Bales.	Acres.	Pounds.	Acres.	Bushels.	Irish.	Sweet.	Acres.	Bushels.	Acres.	Bushels.
		475 lbs.					Bushels.	Bushels.				
Total for the State.....	45,040	19,595	140,791	79,988,868	1,768,127	20,119,761	2,016,700	1,901,521	563,443	5,333,181	901,177	7,826,174
Total for cotton counties.....	45,040	19,595	12,509	6,561,375	229,814	2,595,289	226,420	346,402	51,498	466,087	31,173	203,799
TIDE-WATER REGION.												
King and Queen	80	20	30	14,711	21,232	252,546	8,214	17,901	1,334	10,526	5,260	34,071
Prince George	1,000	700	27	20,500	16,186	183,688	4,085	10,995	5,953	54,205	3,047	33,441
Sussex	4,800	1,950	5	4,715	18,746	163,686	2,290	7,140	2,371	25,337	333	2,471
Isle of Wight	850	400	5	420	18,038	228,998	33,874	52,986	1,568	10,447	141	1,547
Nansemond	1,900	800	1	215	25,750	280,854	196,544	97,880	2,147	20,647	407	5,486
Southampton	11,500	5,200	5	775	36,012	390,968	5,744	68,315	1,417	15,061	101	858
Greenville	8,500	4,100	11	5,075	12,745	145,674	5,291	18,956	1,867	18,525	451	3,493
Total	20,590	12,170	84	46,411	148,709	1,646,409	196,048	274,173	17,147	169,838	9,740	81,307
OAK UPLANDS REGION.												
Dinwiddie	6,500	2,500	2,752	1,540,395	22,720	214,160	8,463	17,535	7,907	45,285	5,310	45,265
Mecklenburg	2,150	975	6,430	3,436,408	34,268	462,512	10,680	34,564	15,811	185,345	10,648	80,363
Brunswick	6,800	2,950	2,734	1,538,161	24,117	272,208	5,229	20,130	10,633	65,619	5,575	50,874
Total	15,450	6,425	11,925	6,514,964	81,105	948,880	30,372	72,220	34,351	296,249	21,433	132,432

PART I.

PHYSICO-GEOGRAPHICAL AND AGRICULTURAL DESCRIPTION
OF THE
STATE OF VIRGINIA.

OUTLINES OF THE PHYSICO-GEOGRAPHICAL FEATURES OF THE STATE OF VIRGINIA.

Virginia, one of the middle Atlantic states, is situated between the parallels of $36^{\circ} 33\frac{1}{4}'$ and $39^{\circ} 27'$ north latitude, in the zone of southern Europe. On its southern boundary, for a distance of nearly 440 miles, it is conterminous with North Carolina and Tennessee, while on the west and northwest it touches Kentucky and West Virginia, the latter along a very irregular zigzag line, for 450 miles. The Potomac river and Chesapeake bay separate it on the north and east from Maryland, and it has an Atlantic shore-line on the east of 125 miles, extending from North Carolina to Maryland. The area of the state is estimated at 42,450 square miles. (a)

TOPOGRAPHY.—The land surface varies greatly in character, rising very gradually from the coast inland, and at the distance of about 100 miles, in the meridian of Richmond, reaches an elevation of about 150 feet above sea-level. This eastern region is known as tide-water Virginia, and has an extent of more than 11,000 square miles. It is a low, level, or slightly undulating country, which toward the sea is quite flat, and is penetrated with numerous bays and broad tidal rivers, bordered by marshes and swamps. Westward the surface rises by broad and nearly level terraces or benches and becomes more uneven, consisting of broad, flattish swells, separated by the river valleys. Westward of the tide-water region lies a broad, undulating, and rolling plain, which rises along its western border to an elevation of 400 or 500 feet, becoming hilly and broken. This triangular area of more than 12,000 square miles is called the *middle* or *midland* region, and extends to the foot-hills of the Blue Ridge. The rivers, which traverse this region at right angles, cut it up into a succession of northwest and southeast ridges and valleys, so that the surface is quite hilly and broken near the streams. Next in order, to the west, along the base of the Blue Ridge, lies a long, narrow belt of hilly and mountainous country, the *Piedmont*, from 20 to 30 miles in breadth and between 6,000 and 7,000 miles in area, and having an elevation of from 600 to 1,200 feet along its western edge.

The Blue Ridge rises steeply from the Piedmont and marks the eastern margin of a distinct and very different sort of country, which may be designated as the transmontane region. This region comprises three well-marked subdivisions: the *Blue Ridge chain* itself, the *valley*, and the *transmontane* region proper. The *Blue Ridge* for the greater part of its length is a straggling, irregular chain, throwing off spurs and branches each way, but otherwise of simple structure; but south of the water-gaps of the Roanoke it spreads out into a triangular plateau bounded by two chains, which form its escarpments east and west, the former, fronting the Atlantic, retaining the name of the Blue Ridge, and the western limb of the bifurcation taking the name of the Iron mountains, called in North Carolina the Smoky mountains. The elevation of the Blue Ridge varies greatly, from 1,500 feet at Harper's Ferry to more than 3,000 in places, and nearly 4,000 feet in the peaks of Otter, but reaches its culmination southward and beyond the border in the Grandfather plateau, which wants little of being 6,000 feet high.

The valley is a trough-like depression between the Blue Ridge and the Alleghanies and their continuations southward, and has a length in the state of Virginia, from the Potomac to the state of Tennessee, of more than 300 miles, its average breadth being about 20 miles, giving an area of some 6,000 square miles. The different sections of this valley are drained by as many different rivers: the northern and larger section by the Shenandoah (into the Potomac), the southern section into the Holston and the Tennessee, and the others, in succession from north to south, by the James and Roanoke (eastward to the Atlantic) and the New river and Kanawha westward into the Ohio; so that the valley is composed of a succession of inclined valleys, sloping northeast and southwest successively, and rising from an elevation of only 250 feet on the Potomac to nearly 2,000 feet at the head of the Shenandoah, and after several descents and rises of from 500 to 1,000 feet finally reaches, at the head of the Holston (and New river), an elevation of nearly 2,600 feet.

The *mountain* (or transmontane) region proper succeeds the valley on the west, and consists of a succession of narrow, sharp, regular, nearly straight mountain ranges, running northeast and southwest, separated by deep and

a The water surface is said to be 2,325 square miles, leaving the area of land surface as 40,125 square miles, as given on page 3.

narrow valleys, the crests of the chains being from 5 to 7 or 8 miles distant from one another. These valleys, like the greater one before described, are cut up into sections and drained northeast and southwest, and some of its divisions are as elevated as any part of the latter, and in some places even reach 3,000 feet.

CLIMATE.—The territory of Virginia lies mostly between the isotherms of 50° and 60°, the former crossing its southeastern peninsula in the tide-water region, and the latter marking its higher mountain plateaus. The mean annual temperature for the state is 56°; for the tide-water region, 58°; for the middle and Piedmont, 55.6°; and for the valley, 54°. The average mean temperature of the state for January is 42°, and for July 78°. As to mean annual rainfall, nearly the whole state lies in a zone of from 40 to 45 inches, the southeastern angle, about Norfolk, alone touching the zone of from 45 to 50. This precipitation is pretty equally distributed among the seasons. In the tide-water and middle regions the prevailing winds are from the southwest quadrant, and next to that the principal winds come from the opposite or northeast quadrant, the northwest quadrant occupying the third place in importance. In the Piedmont region the southwest quadrant is markedly predominant over all the others; while in the mountain region the southwest quadrant still leads, the northwest standing second in importance, and the southeast third. The notable points about the climate are, first, its range—from that of the southeastern low plain, fronting the Atlantic ocean and tempered by it, to that of the high mountain plateaus of the northwestern margin, where cold temperate conditions prevail; second, its mildness, on the whole, notwithstanding this considerable range; third, its dryness, although the rainfall is abundant, and, compared with most European countries, large. The climate is healthful and favorable to a great variety of agricultural pursuits, from cotton culture in the southeast to that of tobacco and hay in the Piedmont and the mountains.

GEOLOGY.—The different geological formations, like the topographical subdivisions, in Virginia, as in the other Atlantic states, are arranged in successive belts nearly parallel to each other and to the great Appalachian axis. The Quaternary formation is almost exactly coincident in its limits to the tide-water region, which it covers with a thin deposit of beds of shingle, earth, and gravel, which pass eastward into coarse and fine sand, and, near the coast, into clay and marl. Underneath this superficial covering, and cropping out in the lower levels, ravines, and river banks, are found Tertiary marl, shell, and clay beds. The middle and Piedmont regions to the crest of the Blue Ridge are occupied by metamorphic or Archæan rocks—granites, gneisses, and schists, which generally dip to the southeastward and at high angles.

Scattered over this Azoic terrane, generally in trough-like depressions, are frequent long linear or oval patches of red sandstones, conglomerates, and clay, and shale beds of the Mesozoic age, mainly Triassic, nearly horizontal in position. Westward of the crest of the Blue Ridge are encountered in succession the Silurian, lower and upper, in and across the valley, and the Devonian and Silurian in various alternations in the successive parallel sharp ridges and chains of mountains toward the western border and the Alleghanies. Toward the southwest the state pushes an angular area northwestward to the Cumberland mountains, and so includes about 1,000 square miles of the Carboniferous rocks—the great Appalachian coal formation, so conspicuously exposed along the cañon of the Kanawha. The outcrops of these Paleozoic formations succeed each other and repeat themselves in successive sharp folds, forming many anticlines and synclines, and, with many notable and extensive faults, making one of the most interesting and instructive sections of these rocks in the whole length of the great Appalachian uplift. Besides their coal beds, the older formations contain numerous deposits of iron ore, which throughout the mountain region crop out in beds of limonites and hematites of enormous extent. In this region are also found marble, kaolin, lead, zinc, glass sand, barites, manganese, gypsum, and salt. In the Piedmont and Blue Ridge regions are found large deposits of iron ores, copper, and marble, barite, lead, and manganese, in the middle region gold, silver, and copper, various kinds of iron ore, and bituminous coal (in the Trias near Richmond), and in the tide-water region marls and brick and fire clays, while in all the divisions of the state limestones and building materials are found, and in most of them in great variety and abundance.

AGRICULTURAL REGIONS.—The topographical and geological features above described suggest at once the agricultural subdivisions:

1. The tide-water region, subdivided into—
 - a. The alluvial region proper, or seaboard region.
 - b. The sandy oak and pine ridges.
2. The oak uplands region.
3. The transmontane and valley region.

THE TIDE-WATER REGION.

The tide-water region contains about 11,000 square miles of territory.

THE ALLUVIAL, OR SEABOARD REGION.—This subdivision includes the peninsula between the Atlantic ocean and Chesapeake bay and the Norfolk peninsula between the Atlantic on the east and Nansemond river and Dismal swamp on the west, and to this would properly be added the ends and the other peninsulas that project between the numerous arms of the Chesapeake, as well as considerable marginal tracts along the numerous bays and bayous, amounting in all to more than 2,000 square miles of area. The description of this tract is the same as that of the corresponding adjacent region of North Carolina. It is composed largely of swamps and semi-swamps and oak and pine flats, with fine gray and ash-colored silty soils, sometimes clayey, covered with a heavy growth of white

oaks and hickories, oak, and short-leaf pines, such as the tract south of Norfolk, toward the North Carolina line, traversed by the Norfolk and Edenton railroad; sometimes composed chiefly of very fine sand and a small percentage of clay, presenting the physical characteristics of the latter, and again of very dark and peaty soils, as around the margin of the Dismal swamp in many places and in the swampy tracts near the smaller streams, with a growth of short-leaf pine, maple, ash, small black and sweet gums, and poplar. Much of this land may be described as "low, flat, and sandy; the soil thin, light, and soft, warm, and easily tilled"; in a word, as "garden soils". (a) The subsoil is commonly a stiff or a yellow to brown sandy clay.

SANDY OAK AND PINE RIDGES.—These generally lie level or in gentle slopes, and the soil is sandy or clayey in patches, generally poor, but susceptible of improvement, responding readily to the use of marls and other fertilizers. Occasionally these soils are very sandy and of little value. The growth is short-leaf pine, small oaks, dogwood, and underbrush, the long-leaf pine, which formerly made a component of these forests south of the James river, having nearly disappeared. The subsoil is commonly of a yellow or brown color, and is composed largely of sand, with a little clay. In some parts of this region, especially in the southwest—south of Petersburg and toward the North Carolina line—these lands repeat the features of the upland piny woods of North Carolina, having a sandy loam soil and a yellow or red clay or sandy clay subsoil. Nearly the whole of this region is underlaid by the Tertiary marls, and has a ready and abundant means for the indefinite improvement of its soils, and many of the farmers have learned the value of this resource under the intelligent teaching and example of Edmund Ruffin. The character and value of these marls may be seen in the analysis given for those of North Carolina, which they exactly resemble. (See page 22 of that report.)

THE OAK UPLANDS REGION.

The soils of this region, derived from the underlying metamorphic rocks, of course vary in composition and character according to the changing character of their origin from one terrane to another, the hornblende granites and gneisses, the traps, and the epidotic and chloritic beds giving rise to rich mulatto and red-clay soils; the quartzose light-colored gneisses and schist and the quartzites and clay slates form poor or moderately productive sandy and gravelly loams, with yellow or brown clay or sandy clay subsoils. The growth of timber of course varies with the quality of the soil, and furnishes the observing farmer a sure criterion by which to grade the value of land and to determine its adaptations to different crops. The red lands have characteristically a heavy growth of oaks, hickory, poplar (*Liriodendron*), and walnut, and are specially adapted to wheat. The gray sandy and gravelly loams have a smaller and more scattered growth of oaks, with short-leaf pine (*P. mitis*), dogwood, sourwood, sassafras, and various underbrush, and, toward the Piedmont region, of chestnut, chestnut oak, and Jersey pine, but are poor or of moderate fertility, and are specially adapted to the finer varieties of tobacco. The red sandstone (Triassic) belts of the middle country belong to the oak uplands; their soils are commonly red or brown loams, which are moderately and often very productive and easy of tillage. These soils, as in North Carolina, belong for the most part to the best class of tobacco lands. The rivers, creeks, and smaller streams of this region are often bordered by extensive alluvial tracts or "bottoms", which are commonly the most productive and durable lands, and are the staple *corn lands* of the region. The soils are usually clays or clay loams, and were originally covered with heavy white oak, hickory, poplar, and walnut forests. These lands comprise in many counties from one-twentieth to one-tenth of the total area and a much larger proportion of the tilled land, as they are always the first to be cleared on the farm, and are rarely "turned out".

THE TRANSMONTANE AND VALLEY REGION.

This great valley being a limestone region, the soils generally are what are called limestone soils. (a) "The prevailing soil is a stiff, clayey loam, durable and fertile, and well adapted to the growth of grass and grain." "In the slaty belt is a lighter and warmer soil. There are also belts of sandy and gravelly soil. Much the larger part of the valley has naturally a good soil." "The streams are very winding, and there is a considerable area of bottom lands."

Beyond the valley, in the Alleghany ridges, the soils are very various, those of the sandstone ridges and slate valleys being poor and thin, while those of the limestone and of some of the shales are very rich. On the streams everywhere are alluvial lands.

COTTON PRODUCTION IN VIRGINIA.

REMARKS ON COTTON PRODUCTION IN THE STATE.

Among the cotton states Virginia ranks fifth in population, twelfth in cotton production (19,595 bales), and eighth (with North Carolina) in average product per acre (0.44 of a bale). The product in 1860 was 12,727 bales; in 1870, 183 bales.

TABLE III.—SHOWING POPULATION AND COTTON-PRODUCTION IN EACH AGRICULTURAL REGION OF THE STATE.

	POPULATION.			COTTON PRODUCTION.								Percentage of state's total production.	Average cotton acreage per square mile.
	Total.	White.	Colored.	Acres.	Percentage of filled land devoted to cotton.	Bales.	Average per acre.			Total in tons.			
							Fraction of a bale.	Seed-cotton.	Lint.	Lint.	Seed.		
Total for the state.....	1, 512, 565	880, 858	631, 707	45, 040	0. 61	19, 595	0. 44	Lbs. 621	Lbs. 207	4, 654	13, 962	100	1. 12
Tide-water region	83, 512	34, 082	48, 530	20, 590	6. 88	13, 170	0. 45	633	211	3, 128	9, 384	67	11. 00
Oak uplands region	74, 187	28, 081	45, 506	15, 450	4. 98	6, 425	0. 42	504	198	1, 526	4, 578	33	8. 93

TABLE IV.—SHOWING "BANNER COUNTIES" AS REGARDS TOTAL PRODUCTION AND PRODUCT PER ACRE IN EACH AGRICULTURAL REGION.

Regions according to product per acre.	Average product per acre of the region in bales.	Counties in each region having highest total production.	Rank in product per acre in the state.	Cotton acreage.	Total product in bales.	Product per acre in bales.	Counties in each region having highest product per acre.	Rank in total production in the state.	Cotton acreage.	Total production in bales.	Product per acre in bales.	Rank in product per acre in the state.
Tide-water region.....	0.45	Southampton.....	4	11,500	5,200	0.45	Greensville.....	2	8,500	4,100	0.48	1
Oak uplands region.....	0.42	Brunswick.....	5	6,800	2,950	0.43	Mecklenburg.....	6	2,150	975	0.45	3

NOTE.—In making estimates for this table all counties are excluded whose total production is less than 100 bales.

It will be noted that the alluvial or tide-water region does not take precedence in cotton production, as the corresponding adjacent (long-leaf pine) region in North Carolina does, and as would be expected from their relative situation. The three oak uplands counties, in fact, lead by a little, because of the substitution of the peanut as a money crop in the former. In some of the counties the change has taken place in the last three or four years, while this crop has not been adopted to any considerable extent over the border. It is also observable that, while the seaboard section of North Carolina has a sufficiently large and rapidly increasing cotton production to take rank as one of the cotton regions of North Carolina, in Virginia these counties produce no cotton at all, the small cotton product of some of them a few years ago being displaced by garden and orchard products (trucking), in which this section about Norfolk has altogether exceptional facilities, not only in soil and climate, but in nearness to the great markets and in the amplest and cheapest and most rapid transportation.

There are only ten counties that produce cotton, and all lie in the southeastern angle of the state between the James river and the North Carolina line, except one, King and Queen, which makes less than 100 bales. Of the nine cotton counties proper five are situated along the North Carolina border west of the Dismal swamp, and the four others form a second tier north of the former; so that the cotton area of Virginia merely forms a slight extension northward of the cotton area of that state, and all these cotton counties, except three, belong to the tide-water or alluvial region.

In comparing the cotton product of 1880 with that of 1860 and 1870 the culture of cotton appears to have been annihilated by the war and to have made no movement toward revival in 1870. Its growth within the past decade to more than 50 per cent. above the crop of 1860, and the removal of the boundary of the cotton-growing belt into the oak uplands and its encroachment on the territory of tobacco, are due to the same cause as in North Carolina, viz, the use of commercial fertilizers, which have rendered its culture profitable in places where otherwise it would be quite impracticable. But the probability seems to be that it has about reached the limit of its expansion in the state, since, as above stated, in the tide-water region it is already retreating before the culture of the peanut, and in the oak uplands, as in the adjacent section of North Carolina, it has scarcely held its ground in the past few years against the improved and far more profitable form of tobacco culture recently introduced, that of the coal-cured, bright tobacco.

PART II.

AGRICULTURAL DESCRIPTIONS
OF THE
COTTON-GROWING COUNTIES OF THE STATE.

AGRICULTURAL DESCRIPTIONS

OF THE

COTTON-GROWING COUNTIES OF VIRGINIA.

The ten counties that produce cotton are grouped according to their agricultural regions, and all, except King and Queen, lie in the southeastern angle of the state.

Reports were received from only four counties. To the description of these abstracts of the reports are appended, giving the natural features, production, etc. The parts of the reports relating to agricultural and commercial practice will be found summarized in Part III.

TIDE-WATER OR ALLUVIAL REGION.

The cotton-growing counties belonging to this region are Nansemond, Isle of Wight, Southampton, Sussex, Greensville, Prince George, and King and Queen.

NANSEMOND.

Population: 15,903.—White, 7,728; colored, 8,175.

Area: 400 square miles.—Woodland, 114,452 acres.

Tilled lands: 57,651 acres.—Area planted in cotton, 1,960 acres; in corn, 25,750 acres; in wheat, 407 acres; in oats, 2,147 acres.

Cotton production: 800 bales; average cotton product per acre, 0.41 bale, 582 pounds seed-cotton, or 194 pounds cotton lint.

Nansemond county lies east and west between the Dismal swamp (a large section of which it includes) and the Blackwater river, and reaches north and south from the James river to the North Carolina line. Its highest portions are from 50 to 60 feet above tide. The county includes large bodies of swamp and semi-swamp lands, as in the Dismal swamp and around its margins, as well as along the Blackwater and other streams. When drained, these lands are very productive, but they are not adapted to cotton. The timber is short-leaf pine, oaks, and underbrush. The long-leaf pine has been nearly exterminated by the saw-mills.

The soil of the level pine woods is of the normal character of that of the region already described. Cotton culture has greatly increased during the last decade, especially within the last year or two, and has extended over the whole county, although the bulk of the crop is made in the southern half. Of its area, 22.5 per cent. is under cultivation, 3.4 per cent. of which is devoted to cotton.

ABSTRACT OF THE REPORT OF JOHN A. CUTCHIN, OF CARRSVILLE.

The principal soil is a *dark sandy*, with clay subsoil, and extends throughout this township. The natural timber is pine and red and white oak, with a thick undergrowth of smaller kinds of timber. The chief crops are corn, cotton, peanuts, sweet and Irish potatoe and truck. Cotton occupies about one-tenth of the land cultivated. The stalk attains a height of from 2½ to 3 feet, and is most productive at the latter height. The cotton-plant inclines to run to weed in wet seasons, about the time it is blooming, and topping is resorted to in July and August to restrain it. Fresh land produces 1,000 pounds of seed-cotton per acre, 1,425 pounds making a 475-pound bale of lint; clean staple rates low middling. Crab-grass is the most troublesome.

Cotton shipments are made by rail to Norfolk.

ISLE OF WIGHT.

Population: 10,572.—White, 6,010; colored, 4,562.

Area: 290 square miles.—Woodland, 115,799 acres.

Tilled lands: 50,756 acres.—Area planted in cotton, 850 acres; in corn, 18,038 acres; in wheat, 141 acres; in oats, 1,568 acres.

Cotton production: 400 bales; average cotton product per acre, 0.47 bale, 672 pounds seed-cotton, or 224 pounds cotton lint.

Isle of Wight county lies north of Nansemond, and between the James and the Blackwater. The physical and agricultural features are the same as those of the latter; but being situated farther north, it is less adapted to cotton and better adapted to peanuts. There is little left of the long-leaf pine here also, although it was formerly abundant in the southern and southwestern sections and supported a thriving turpentine industry half a century ago. Twenty-seven and three-tenths per cent. of the county area is under cultivation, and of this 1.7 per cent. is devoted to cotton.

Mr. N. P. Young, of Isle of Wight Court-House, reports as follows:

From the best information I can obtain cotton is cultivated to a very limited extent. I do not think an average of 10 bales a year is made in the county, its cultivation having been almost entirely abandoned for that of peanuts.

Cotton is shipped to Norfolk by railroad.

SOUTHAMPTON.

Population: 18,012.—White, 7,447; colored, 10,565.

Area: 610 square miles.—Woodland, 149,631 acres.

Tilled lands: 107,269 acres.—Area planted in cotton, 11,500 acres; in corn, 36,012 acres; in wheat, 101 acres; in oats, 1,417 acres.

Cotton production: 5,200 bales; average cotton product per acre, 0.45 bale, 645 pounds seed-cotton, or 215 pounds cotton lint.

Southampton county is situated on the North Carolina border between the Blackwater and the Meherrin rivers, and is traversed through its middle portion by the Nottoway. It rises in its western and northern sections to a height of over 100 feet above tide. The surface is generally level, or but little rolling, and occasionally it is hilly in the western section near the rivers. The timber consists chiefly of short-leaf pine and oaks, intermixed with dogwood, maple, hickory, poplar, sassafras, gums, and various underbrush. Of the county area, 27.5 per cent. is under cultivation, and of this 10.7 per cent. is in cotton.

The cotton crop is mostly made south of the Nottoway, the chief crop of the northern section being peanuts, although cotton is raised in all sections.

ABSTRACT OF THE REPORT OF DR. W. H. DAUGHTRY, OF NEWSOM'S.

The chief soil is mostly of a *light gray sandy character*, with yellow or red subsoil, which occupies about one-half of the lands in this region, and is timbered with pine, oak, hickory, dogwood, maple, and poplar. The light, fine sandy surface soil is from 4 to 6 inches thick, and is easily tilled. The chief crops produced here are corn, cotton, peanuts, and potatoes, but the soil is apparently best adapted to corn. About one-sixth of the arable land is planted in cotton. The plant attains the height of from 2 to 4 feet, and is most productive when 3 feet in height, but it inclines to run to weed in wet and warm weather. Very little of this land lies turned out. The product is from 400 to 600 pounds of seed-cotton per acre, and 1,425 pounds make a 475-pound bale. After five years' cultivation the product is about 400 pounds per acre. Crab- and wire-grass and hog-weed are most troublesome. Very little land lies turned out, and it produces well when again taken in. Very little damage is done by washing or gullies on the slopes.

A second quality of land, designated as *white-oak land*, comprises about one-fourth of the lands of the region, and has a timber growth of oak, gum, pine, etc. The soil is a clay, 4 inches in thickness, over a blue-clay subsoil. One-fourth is planted in cotton, though the land is best adapted to clover.

Shipments to Norfolk by rail or steamer; freight, \$1 per bale.

The report of Mr. J. D. Prettow, of Franklin, agrees generally with the preceding.

Four-fifths of the lands are of the description of No. 1, and have a red sandy clay subsoil. One-tenth is planted in cotton, which grows from 3 to 5 feet high. About one-sixth lies turned out. Peanuts are the most profitable crop.

SUSSEX.

Population: 10,062.—White, 3,331; colored, 6,701.

Area: 400 square miles.—Woodland, 107,617 acres.

Tilled lands: 54,989 acres.—Area planted in cotton, 4,800 acres; in corn, 18,746 acres; in wheat, 333 acres; in oats, 2,871 acres.

Cotton production: 1,950 bales; average cotton product per acre, 0.41 bale, 579 pounds seed-cotton, or 193 pounds cotton lint.

Sussex county lies north of and adjacent to Southampton, and between the upper affluents of the Blackwater and the Nottoway, and its territory is nearly all included between the Petersburg and the Norfolk and Petersburg railroad. The long-leaf pine formerly extended into the southern and eastern sections, but has almost entirely disappeared. The soil and timber are in the southern part like those of Southampton, but toward the west and north the surface becomes more uneven, and approximates the character of the oak uplands. But little cotton is made in this section, its culture being confined to the southern half, peanuts being the staple crop northward. Of the county area, 21.5 per cent. is under cultivation, and of this 8.7 per cent. is devoted to cotton.

ABSTRACT OF THE REPORT OF J. D. THORNTON, OF SUSSEX COURT-HOUSE.

Our county, except the extreme western portion, which is hilly and not adapted to cotton, is mostly level.

The *light-gray soil*, which occupies three-fourths of the land, extends toward the south and east fully 50 miles, but toward the north and west it assumes a different character, and is a heavy red clay. Pine is the principal timber, but red oak, hickory, and dogwood prevail, as also white oak in the flats. The surface soil is a fine gray loam of close texture, with but little sand; sometimes the color is a rich chocolate to the depth of 6 inches, when it changes into that of the subsoil, which is heavier than the surface soil. On the best lands the subsoil is of a deep red, which in two or three years becomes light and friable, mingling easily and advantageously with the upper soil.

This soil is easy to till in wet or dry seasons, and is early, warm, and naturally well drained. Peanuts have within three or four years become the principal money crop, having superseded cotton; the other main crops are corn, oats, and wheat. The cotton-plant usually attains a height of from 2½ to 3 feet, and is most productive at that height. It inclines to run to weed in very rich land, especially when there is much moisture in the soil; topping is resorted to by some to restrain this tendency. In fresh land the product is about 500 pounds of seed-cotton per acre, and 1,425 pounds are required to make a 475-pound bale of lint. If not manured, the crop becomes annually less. Crab-grass is the chief pest; also some wire-grass. But little land now lies turned out.

Cotton shipments are made in November and December by rail to Petersburg. The rate of freight is from 35 to 50 cents, according to weight.

GREENSVILLE.

Population: 8,407.—White, 2,757; colored, 5,650.

Area: 330 square miles.—Woodland, 81,105 acres.

Tilled lands: 42,556 acres.—Area planted in cotton, 8,500 acres; in corn, 12,745 acres; in wheat, 451 acres; in oats, 1,857 acres.

Cotton production: 4,100 bales; average cotton product per acre, 0.48 bale, 687 pounds seed-cotton, or 229 pounds cotton lint.

Greensville county lies on the southern border, and belongs mainly to the alluvial region, its western end rising into that of the oak uplands. Its general elevation is above 150 feet, the body of the county lying west of the Petersburg railroad and being above that level. The abstract below gives a sufficiently full account of its agricultural features and products. Of the county area, 20.1 per cent. is under cultivation. Cotton comprises 20 per cent. of the tilled lands.

ABSTRACT OF THE REPORT OF JULIUS F. BINGHAM, OF POPLAR MOUNT.

The kinds of soil are: First, the gray sandy; second, the sandy loam; and last, the red clay.

The chief soil is the *gray sandy or light lands*, which occupy one-half of the lands in this region and are timbered with oak, pine, hickory, ash, poplar (tulip tree), black walnut, and maple. The average thickness of the surface soil is 10 inches; the subsoil is heavier, and is generally a mixture of yellow sand and clay. The soil is easy to till, early, warm, and well drained. The chief crops are cotton, peanuts, corn, oats, and potatoes, but the soil is best adapted to cotton and peanuts, and cotton occupies about one-third of the cultivated portion. It is most productive when from 2½ to 3 feet high, and is inclined to run to weed in wet seasons. Shallow cultivation and topping are resorted to as preventives. Fresh land produces 600 pounds of seed-cotton per acre, 1,425 pounds making a 475-pound bale of lint; clean staple rates as middling. After four years' cultivation without manure the production falls off rapidly. About one-fourth of the land now lies turned out, and it improves by rest. Where the land is hilly it is apt to wash, but this is easily obviated by horizontal ditches; the valleys are generally improved by washings from the hills.

No. 2. *Sandy loam* comprises one-fourth of the lands, occurring in large bodies on Three Creeks and on both sides of the Meherrin river. The timber growth has more ash and maple than in No. 1. The color of the soil is dark gray to a depth of from 8 to 12 inches; the subsoil is a yellow or red clay, best adapted to cotton and corn, but one-half is planted in cotton. Crab-grass is troublesome.

No. 3. The *red-clay* soils comprise one-fourth of the lands, and lie in the western end of county. The timber is oak, hickory, ash, and maple. The color of soil is deep mahogany, red and chocolate. The soil is 8 inches deep, and is best adapted to wheat, clover, and grass; very little is planted in cotton. About one-fourth of this land lies turned out, which produces well after a few years' rest, but washes and gullies badly. The valleys are not injured by the washings, but are often improved. These washings are checked by hillside ditching and horizontalizing.

Cotton shipments are to Norfolk and Petersburg by rail; freight, 90 cents to \$1 per bale.

Mr. W. F. Avent, of Hopeville, also makes report, agreeing in the main with the above, but differing in some of his estimates.

The proportion of *light sandy land* is four-fifths; the depth of soil, 6 inches, and the proportion of cotton planted one-half. When the soil is worn out it is occupied by old field pines. The lands are generally very poor, and one-half now lies turned out. The chief crops of the western section are tobacco and wheat.

PRINCE GEORGE.

Population: 10,054.—White, 3,255; colored, 6,799.

Area: 300 square miles.—Woodland, 60,315 acres.

Tilled lands: 59,243 acres.—Area planted in cotton, 1,900 acres; in corn, 16,186 acres; in wheat, 3,047 acres; in oats, 5,953 acres.

Cotton production: 700 bales; average cotton product per acre, 0.37 bale, 525 pounds seed-cotton, or 175 pounds pounds cotton lint.

Prince George county is situated on the western edge of the tide-water plain between the Petersburg railroad and the James river, and north of the county of Sussex, before described. Its elevation is below 100 feet for the most part, but topographically it is generally level or but little rolling, and somewhat hilly near the streams. Its forests present the usual mixture of oaks and short-leaf pine, etc., and its soils are generally the common light-gray sandy and gravelly loams of the region. It lies just beyond the border of the long-leaf pine region, its eastern angle near the James river having a few scattered specimens only. Of the county area, 30.9 per cent. is under cultivation, and 3.2 per cent. of its tilled lands are devoted to cotton. This may be regarded as the northern extremity of the cotton zone of the south. The small crop of cotton is shipped to Norfolk by steamer or by rail.

KING AND QUEEN.

Population: 10,502.—White, 4,424; colored, 6,078.

Area: 360 square miles.—Woodland, 72,804 acres.

Tilled lands: 91,086 acres.—Area planted in cotton, 80 acres; in corn, 21,232 acres; in wheat, 5,260 acres; in oats, 1,334 acres.

Cotton production: 20 bales; average cotton product per acre, 0.25 bale, 357 pounds seed-cotton, or 119 pounds cotton lint.

King and Queen county is quite exceptionally situated for a cotton county, being not only north of the James river, but north of York river (Pamunkey), and some 30 miles northeast of Richmond. It lies near the western border of the tide-water region, in the section of the level sandy ridge soils. As there is no report from this county, the peculiar local circumstances and climatic conditions which render the culture of cotton practicable so far out of its range cannot be given. The percentage of area under cultivation is 39.5, and of this 0.1 per cent. is devoted to cotton.

OAK UPLANDS REGION.

Cotton is grown in three counties of the region: Brunswick, Mecklenburg, and Dinwiddie.

BRUNSWICK.

Population: 16,707.—White, 6,022; colored, 10,685.

Area: 580 square miles.—Woodland, 167,621 acres.

Tilled lands: 96,731 acres.—Area planted in cotton, 6,800 acres; in corn, 24,117 acres; in wheat, 5,575 acres; in oats, 10,633 acres.

Cotton production: 2,950 bales; average cotton product per acre, 0.43 bale, 618 pounds seed-cotton, or 206 pounds cotton lint.

Brunswick county lies adjacent to the oak uplands cotton section of North Carolina, near the eastern edge of the region, and has, therefore, only a moderate elevation of between 200 and 300 feet. It reaches northward to the main branch of the Nottoway. Its physical and agricultural characteristics are normal for this section, and the surface moderately rolling or hilly near the streams. The forests are of oak, short-leaf pine (*P. mitis*), hickory, dogwood, etc. The soils generally are a gray sandy loam on the ridges, reddish and more clayey on the slopes, with strips of red clay and mulatto soils wherever the rocks are hornblendic. Of the area, 26 per cent. is in cultivation, and of this 7 per cent. is devoted to cotton. The cotton product is made, of course, mainly in the southern part of the county. No report has been received, so that further details cannot be given.

MECKLENBURG.

Population: 24,610.—White, 8,222; colored, 16,388.

Area: 610 square miles.—Woodland, 170,685 acres.

Tilled lands: 127,922 acres.—Area planted in cotton, 2,150 acres; in corn, 34,268 acres; in wheat, 10,548 acres; in oats, 15,811 acres.

Cotton production: 975 bales; average cotton product per acre, 0.45 bale, 645 pounds seed-cotton, or 215 pounds cotton lint.

Mecklenburg county lies west of Brunswick and on the North Carolina border, and is on the extreme northwestern limit of the cotton belt (the larger part outside of it). It is a little more elevated (from 300 to 500 feet) and more hilly than Brunswick. Roanoke river flows through the southern part, keeping near the border, and its tributaries drain nearly the whole county. This river is navigable for flat-boats, by means of which the tobacco crop has long been carried to market. It has now also the advantage of transportation by rail. The principal town is Clarksville, at the forks of the Roanoke, the confluence of the Staunton and Dan rivers. The forests and soils are like those of Brunswick county, with an increase in the proportion of red clays. The main agricultural interest centers in tobacco, but it is a good grain country also. Of its area, 32.8 per cent. is in cultivation, and of this 1.7 per cent. is devoted to cotton.

DINWIDDIE.

Population: 32,870.—White, 14,437; colored, 18,433.

Area: 540 square miles.—Woodland, 133,561 acres.

Tilled lands: 85,408 acres.—Area planted in cotton, 6,500 acres; in corn, 22,720 acres; in wheat, 5,310 acres; in oats, 7,907 acres.

Cotton production: 2,500 bales; average cotton product per acre, 0.38 bale, 549 pounds seed-cotton, or 183 pounds cotton lint.

Dinwiddie county lies north of Brunswick, and extends north to the Appomattox river, but it is drained mostly by the various branches of the Nottoway. Its situation is like that of Brunswick, on the eastern border of the oak uplands region. It has about the same elevation, geographical features, agricultural characteristics, and industries, dividing its interest between cotton and tobacco. Petersburg is its chief town. Of its area, 24.7 per cent. is under cultivation, and 7.7 per cent. of this is devoted to cotton. Its means of transportation are ample, and are by river and two railroads to Richmond and Norfolk.

PART III.

CULTURAL AND ECONOMIC DETAILS
OF
COTTON PRODUCTION.

REFERENCE TABLE
OF
REPORTS RECEIVED FROM THE COUNTIES OF VIRGINIA.

TIDE-WATER OR ALLUVIAL REGION.

- Nansemond*.—JOHN A. CATCHIN, Carrsville, Isle of Wight county (farm and residence in Nansemond), describes the lands of his township.
Isle of Wight.—N. P. YOUNG, Isle of Wight Court-House.
Southampton.—J. D. PRETTOW, Franklin, October 12, 1880, describes lands of the county. Dr. W. H. DAUGHTRY, August 19, 1880, of Newsom's, describes lands of the county.
Sussex.—J. D. THORNTON, Sussex Court-House, February 11, 1880, describes lands of the county and region.
Greensville.—JULIUS F. BINGHAM, of Poplar Mount, June 13, 1880, describes lands of the county. W. F. AVANT, of Hopeville, March 29, 1880, describes lands of the county

SUMMARY OF ANSWERS TO SCHEDULE QUESTIONS.

TILLAGE, IMPROVEMENT, ETC.

1. What is the usual depth of tillage? What draft is employed in breaking up? Is subsoiling, fall plowing, fallowing, or rotation of crops practiced?

Greenville: The depth of tillage is usually 4 inches, and one horse or mule is employed. Subsoiling is not done. Fall plowing is practiced in Nansemond, and but very little in other counties; results are beneficial. Fallowing is practiced to some extent, and the lands are tilled while lying fallow. *Sussex:* Generally sown in wheat or clover, the lands are rapidly recuper-

ated. *Southampton:* Lands are only turned out. Rotation of crops is practiced in Greenville and Nansemond with corn, sweet potatoes, oats, and wheat, and maintains the average fertility of the soil. It is not practiced in Sussex, but is in Southampton with corn, sweet potatoes, oats, and peanuts.

2. What fertilizers, or other direct means of improving the soil, are used by you, or in your region? Is green-manuring practiced? With what results?

Greenville: Barn-yard manure, compost of manure of animals, with rich mold and superphosphates, with good results. Green manuring is practiced with cow-pease with fine results. *Nansemond:* Peruvian, lime, phosphates, etc. Green manuring to some extent with cow-pease, which lightens and enriches the soil. *Sussex:* Compost of ashes, cottonseed, wood-mold;

also commercial fertilizers; the results are good. Green manuring with cow-pease and rye; the results are most satisfactory. *Southampton:* Barn-yard manure, guano, bone, kainit, etc., with good results. Occasionally with cow-pease, and with very good success.

3. How is cottonseed disposed of? If sold, on what terms, or at what price? Is the cake used with you for feed? Is it used for manure?

Greenville: Some is fed to cows, but it is usually put in compost heaps; when sold, the price is 10 cents per bushel. *Nansemond:* Mixed with stable manure and wood-mold and spread in the drill; price, when sold, 12½ cents per bushel. *Sussex* and

Southampton: Put in compost heaps; when sold, the price is from 8 to 12 cents per bushel. Cottonseed-cake is not used for feed, but is used for manure in Greenville, mixed with vegetable mold and animal matter.

PLANTING AND CULTIVATION OF COTTON.

4. What preparation is usually given to cotton land before bedding up? Do you plant in ridges, and how far apart? What variety is preferred, and how much seed is used per acre?

Greenville: We turn it over in the spring plowing, and then bed it up and plant. *Nansemond:* Flushing when it can be done; spring plowing when we are unable to plow in the fall. *Sussex* and *Southampton:* Spring plowing, then marking the rows and bed up. Cotton is usually planted in ridges, 3 feet apart

on ordinary land and 3½ feet on rich lands. Varieties of cotton are the Johnson, Davidson, Boyd, Peeler, Williams, and Little Rock. Three bushels of seed are used per acre.

5. What implements do you use in planting? Are cottonseed planters used, and what opinion is held of their efficacy or convenience?

Planters are used in all the counties except Sussex, where the rows are opened up with a plow, the seed is dropped by hand, and

covered with a log drawn across two rows at once. The cottonseed planters are well thought of where used.

6. What is the usual planting time? How long before the seed comes up, and at what stage of growth do you thin out?

The usual planting time is from April 25 to May in Sussex and Southampton, and from May 1 to 10 in the other counties. The seed comes up in from 5 to 10 days in Greenville; from 7 to 10 days in other counties. The plants are thinned out

to distances of from 8 to 10 inches when the crop is entirely up, when from 5 to 6 inches high, or when the third leaf appears on the plants.

7. What after-cultivation do you give, and with what implements? Is your cotton liable to suffer from "sore-shin"?

Greensville: Plow with sweep about three times, using the hoe when necessary.

Nansemond: Keep it well grassed, and give it three plowings, first scraping and then using a cotton plow to work up the soil.

Sussex and Southampton: Work with the plow and take out the grass and weeds with a hand hoe.

"Sore-shin" does not appear in any county, except Nansemond, and there only when injured by the plow or hoe.

8. What is the height usually attained by your cotton before blooming? When do you usually see the first blooms? When do the bolls first open, and when do you begin your first picking?

Blooms appear when cotton is from 12 to 18 inches high in *Greensville* and *Nansemond*, and from 18 to 24 inches in *Sussex* and *Southampton*, and usually about the 1st of July. Bolls open about the last of August in *Sussex* and *Southampton*, but early

in *September* in other counties. Picking begins October 1 in *Sussex*, and from September 15 to the 30th in other counties.

9. How many pickings do you usually make, and when? Do you ordinarily pick all your cotton? At what time does picking usually close? When do you expect the first black frost? Do you pen your seed-cotton in the field or gin as picking progresses?

Two pickings are made in *Nansemond* and *Sussex*, October 1 and the last of November in the former, and October and November and December and January in the latter county. Three pickings are made in *Greensville* and *Southampton*, September 20, October 20, and December 15. All the cotton is usually picked and the season closes from the 15th to the 25th of December

in three counties, and in January in *Sussex*.

The first black frost is expected October 1 in *Nansemond*, from October 10 to 20 in *Sussex* and *Southampton*, and November 1 in *Greensville*.

Cotton is ginned as picking progresses in all counties.

GINNING, BALING, AND SHIPPING.

10. What gin do you use? How many saws? What motive power? If draft animals, which mechanical "power" arrangement do you prefer? How much clean lint do you make in a day's run of ten hours? How much seed-cotton is required for a 475-pound bale of lint?

Brown's gin, of 60 saws, in *Nansemond* and *Southampton*; with water-power turbine wheel, or with $4\frac{1}{2}$ horse-power steam-engine, it makes 2,500 pounds of lint per day.

Taylor's gin in *Sussex*, from 40 to 60 saws; with 4 mules, it makes about 700 pounds of lint.

In *Greensville* various gins, of from 40 to 60 saws, make each about 2,000 pounds of lint.

For a bale of lint is required 1,425 pounds of seed-cotton in *Greensville* and *Nansemond*, from 1,300 to 1,425 in *Sussex*, and 1,360 in *Southampton*.

11. What press do you use for baling? What press is generally used in your region? What is its capacity when run by men and horses or mules?

Greensville: Ball's; when run by 5 men the capacity is 7 or 8 bales per day. *Nansemond*: Large wooden screw. *Sussex*: Virginia.

Southampton: Cockade and hand-presses.

12. Do you use rope or iron ties for baling? If the latter, what fastening do you prefer? What kind of bagging is used? What weight do you aim to give your bales? Have transportation companies imposed any conditions in this respect?

Iron ties are used exclusively, together with both the buckle and the arrow fastening. Double anchor, coarse hemp, gunny, Dundee, and Ludlow bagging is used. The weight of bales is 400

pounds in *Sussex*; 450 pounds in other counties. No conditions have been imposed by transportation companies.

DISEASES, INSECT ENEMIES, ETC.

13. By what accidents of weather, diseases, or insect pests is your cotton crop most liable to be injured—caterpillar, boll-worm, shedding, rot of bolls, rust, or blight? At what dates do these several pests or diseases usually make their appearance, and to what cause is the trouble attributed by your farmers?

Greensville: By shedding, by rust, and by blight. They appear from July 15 to August 1, and are caused by wet weather. *Nansemond*: By rust and by blight. They usually appear in the latter part of August, and are attributed to rainy weather. *Sussex*: By frosts, by blight, and by shedding. We generally look for

frost by October 10, shedding in August, and by rust in September. *Southampton*: By caterpillar and by boll-worm in August, rust, blight, and shedding in last of July or August; rot of bolls in August or September. Wet weather causes shedding, rot of bolls, rust, and blight.

14. What efforts have been made to obviate the trouble? Is Paris green used as a remedy? Is rust or blight prevalent chiefly on heavy or ill-drained soils? Do they prevail in wet or dry, cool or hot seasons?

On the first appearance of rust pull up the affected stalks; this often stops it. *Sussex*: Lime applied to cotton land in the fall or winter is thought to be a preventative for rust, with uncertain results. *Southampton*: Deep plowing and free manuring have been used to prevent rust and blight on ill-drained and thin lands; results were favorable. Paris green

is not used in any county. Rust or blight prevails in *Greensville* and *Southampton* counties on ill-drained soils in wet, hot seasons, and are most common in sandy soils. In *Nansemond* county they prevail on heavy and ill-drained soils in cool, wet seasons. In *Sussex* county they prevail in dry, hot seasons.

LABOR AND SYSTEM OF FARMING.

15. What is the average size of farms or plantations in your region? Is the prevalent practice "mixed farming" or "planting"? Are supplies raised at home or imported; and, if the latter, where from? Is the tendency toward the raising of home supplies increasing or decreasing?

In Nansemond county, 200 acres; in other counties, 400 acres.

"Mixed farming" alone is practiced. Supplies in Sussex county are mostly imported from Baltimore and Cincinnati.

In other counties supplies are mostly raised at home. The tendency toward the latter is increasing, except in Nansemond, where it is unvarying.

16. Who are your laborers chiefly, whites (of what nationality), negroes, or Chinese? How are their wages paid—by the year, month, or day? At what rates? When payable?

Greensville: More than 50 per cent. negroes; they are paid from \$50 to \$100 per year, payable December 25. *Nansemond*: Generally negroes; they are paid from \$75 to \$100 per year, from \$6 to \$10 per month, and from 25 to 50 cents per day, payable as

they want it. *Sussex*: Negroes; they are paid \$80 per year, \$8 per month, or 40 cents per day, with board. *Southampton*: Negroes; they are paid \$6 to \$10 per month, payable when they require it.

17. Are cotton farms worked on shares? On what terms? Are any supplies furnished by the owners? Does your system give satisfaction? How does it affect the soil and quality of the staple?

Sometimes worked on shares. For rent of land the tenant gives one-third of the crop; for rent and teams one-half of the crop. Supplies are seldom furnished by the owners. Perfect satis-

faction is given. The quality of the staple is not affected, but the soil usually deteriorates.

18. Which system (wage or share) is the better for the laborer, and why? What is the condition of the laborer? What proportion of negro laborers own land or the houses in which they live?

Greensville and *Sussex*: Shares, because he takes greater interest in the crop, and can raise pork at the same time; the negro invariably spends his wages as fast as received. *Nansemond* and *Southampton*: Wages, because he works more steadily and can get money as he needs it; laborers are not able to sustain themselves a whole year under the share system.

The condition of the laborer is rather poor in Southampton, comfortable in Greensville, contented in Sussex, and very good in Nansemond.

About one-half of the negro laborers own land in Nansemond, 1 per cent. in Sussex and Southampton, and not one in fifty in Greensville.

19. What is the market value and rent of your lands? How many acres or 450-pound bales per "hand" is your customary estimate?

Lands are valued at from \$3 to \$5 per acre in Greensville and Sussex, from \$3 to \$10 in Southampton, and from \$6 to \$10 per acre in Nansemond county. Rents are from \$2 to \$4 per acre or one-

fourth of the crop. The customary estimate per "hand" is 2 bales in Sussex and 3 bales in Greensville, but in these as well as other counties other crops are raised by the same hands.

20. To what extent does the system of credits or advances upon the growing cotton crop prevail in your region?

Greensville: To an alarming extent. *Nansemond*: Sufficient to supply moderate demands of the tenant or laborer. *Sussex*: Fully nineteen-twentieths of our laborers and farmers obtain their

supplies in this manner. *Southampton*: To so great extent as frequently to absorb the entire crop.

21. At what stage of its production is the cotton crop usually covered by insurance? Is such practice general? What are the merchants' commissions and charges for storing, handling, shipping, insurance, etc., to which your crop is subject? What is the total amount of these charges against the farmer per pound or bale? What is your estimate of the cost of production in your region, exclusive of such charges and with fair soil and management?

Cotton is only insured when stored or ready for market. Charges are 2½ per cent. commission on gross sales and 25 cents per bale for storage and insurance, or a total of about \$1.30 per

bale in Greensville, \$2.50 in Sussex, and \$2 in Southampton. The estimate of cost of production is 8 cents per pound in Sussex and Southampton, and nearly 10 cents in Greensville.

INDEX TO COTTON PRODUCTION IN VIRGINIA.

A.		Page.		Page.
Abstracts of the reports of correspondents.....	12-14		Correspondents, names and addresses of	18
Accidents of weather	20		Cotton acreage per square mile, in counties (table).....	3
Acreage and production of leading crops (table)	3		blooms first appear and bolls first open, when.....	20
Acres cultivated, estimated number of, per hand	21		charges and cost of sale of.....	21
Addresses and names of correspondents.....	18		crop covered by insurance	21
Advances to laborers on growing cotton crop	21		culture rendered profitable by the use of fertilizers... ..	10
After-cultivation of cotton	20		diseases, insect enemies, etc., of	20
Agricultural descriptions of the counties	11-15		lint, amount of, made by gins in a day's run	20
regions, enumeration of.....	8		tons of, in state and regions (table).....	10
Alluvial or sea-board region, area, and description of.....	8, 9		picking begins and closes, when.....	20
Amount of charges per bale against the farmer.....	21		plant, height of, before blooming	20
Answers to schedule questions, summary of.....	19-21		tendency of, to run to weed, and how restrained.	
Area of the alluvial or sea-board region	8, 9		(See under Bolling.)	
midland region.....	7		usual height of (see abstracts in county descrip-	
the state	7		tions).....	12-14
tide-water region	8		planting and cultivation	19, 20
Avent, W. F., mention of	14		production, acres and bales in each county (table) ...	3
Average product per acre of cotton in regions (table)	10		comparison of regions in (tables)	10
B.			cost of, per pound	21
Bagging used in baling cotton	20		cultural and economic details of.....	17-21
Bale, amount of seed-cotton required to make a (see abstracts			distribution of, among the regions.....	10
in county descriptions).....	12-14		general remarks on.....	10
Bales, number of, in regions (table)	10		in the state and counties (table).....	3
per acre in counties, production of (table).....	3		percentage of the state's total, in regions	
hand, usual working estimate of.....	21		(table)	10
usual weight of	20		rank of the state in.....	10
Baling cotton, details of.....	20		product per acre, according to regions.....	10
Banner counties having highest total cotton production and			county ranking highest in.....	10
product per acre in each region (table)....	10		in counties (table)	3
rank of, in other regards (table).....	10		regions (table).....	10
Bingham, J. F., abstract of the report of	14		of any soil, and from fresh and old	
Blight, occurrence of, and how obviated	20		land. (See under Soils.)	
Blooms appear on cotton-plant, when	20		shipments (see county descriptions)	11-15
Blue Ridge region, elevation of.....	7		staple affected by share system.....	21
Bolling favored and cotton-plants restrained from running to			Cottonseed-cake as feed or manure	19
weed by shallow cultivation and topping.....	12, 14		planters, use of.....	19
Bolls first open on cotton-plant, when	20		price of, and how disposed of	19
Boll-worm, appearance of	20		value of, as a fertilizer	19
Brunswick county, statistics and descriptions of	15		varieties and amount of, used per acre.....	19
C.			Counties, agricultural descriptions of	11-15
Carboniferous formation	8		having highest cotton product per acre (table)....	10
Caterpillar, appearance of.....	20		Credit system on growing crop.....	21
Climate of the state	8		Crops, acreage and production of leading (table)	3
Close of the cotton-picking season.....	20		rotation of	19
Composts, use of	19		Cultivation and planting of cotton, details of	19, 20
Condition of laborers	21		Cultural and economic details of cotton production	17-21
Conditions imposed by transportation companies as to weight			Cutchin, J. A., abstract of the report of	12
of bales	20		D.	
Corn, acreage and production of (table)	3		Daughtry, Dr. W. H., abstract of the report of.....	13
			Depth of tillage.....	19

INDEX TO COTTON PRODUCTION IN VIRGINIA.

Details, cultural and economic, of cotton production	Page. 17-21		
Dinwiddie county, statistics and description of	15		
Diseases, insect enemies, etc., of cotton	20		
Dismal swamp, soils and timber growth on the borders of	9		
Draft employed in breaking up land	19		
Drainage of soils. (<i>See</i> under Soils.)			
E.		M.	
Economic and cultural details of cotton production	17-21	Maure, cottonseed-cake used as	Page. 19
Efforts made to obviate insect pests and diseases of cotton ..	20	Mecklenburg county, statistics and description of	15
Elevations of the state	7	Merchants' commissions on sales of cotton	21
Enumeration, tabulated results of the	1-3	Metamorphic formation	8
Estimate of the cost of cotton production	21	rocks, soils derived from	9
F.		Midland region, area of	7
Fallowing and fall plowing, results of	19	Minerals, varieties of	8
Farming and labor, system of	21	Mixed farming or planting	21
Farms, usual size of	21	Mountain region, elevation of	8
Fastening used in baling cotton, kinds of	20	N.	
Feed, cottonseed-cake used as	19	Nansemond county, statistics and description of	12
Fertilizers, cotton culture rendered profitable by the use of ..	10	Nationality and condition of laborers	21
Fertilizing and green-manuring	19	Negroes, proportion of, owning houses or lands	21
Freight, rates of shipment of (<i>see</i> abstracts in county descrip- tions)	12-14	Number of cotton pickings made	20
Frost, time of appearance of the first	20	O.	
G.		Oak uplands region, area and general character of	7, 9
Geology of the state	8	county descriptions of	15
Ginning, baling, and shipping cotton, details of	20	Oats, acreage and production of (table)	3
Gins, cotton, list and capacity of	20	Outlines of the physico-geographical features of the state ..	7-9
Gray sandy and gravelly lands specially adapted to tobacco ..	9	P.	
timber growth of	9	Palaeozoic formation	8
Green-manuring and fertilizing	19	Paris green as a remedy against the caterpillar	20
Greensville county, statistics and description of	14	Peanuts, cultivation of (<i>see</i> county descriptions)	11-15
H.		Picking of cotton begins and closes, when	20
Height attained by cotton before blooming	20	Planting and cultivation of cotton, details of	19, 20
Hillside ditching and horizontalizing (<i>see</i> abstracts in county descriptions)	12-14	Population, average, per square mile (table)	3
Home supplies	21	in regions (table)	10
I.		of the state and counties (table)	3
Implements used in after-cultivation of cotton	20	Potatoes (Irish and sweet), production of (table)	3
cotton-planting	19	Power used in ginning cotton	20
Improvements, tillage, etc., details of	19	Preparation given to cotton lands	19
Information, sources of, in the compilation of this report ..	iii	Presses used in baling cotton, kinds of	20
Insect enemies, diseases, etc., of cotton	20	Pretlow, J. D., mention of report of	13
Insuring cotton, practice of and charges for	21	Prevalence of the credit system	21
Irish and sweet potatoes, production of (table)	3	Price paid for cottonseed	19
Iron-ore beds, occurrence of	8	Prince George county, statistics and description of	14
Isle of Wight county, statistics and description of	12, 13	Production and acreage of leading crops (table)	3
K.		Q.	
King and Queen county, statistics and description of	14, 15	Quaternary formation of the state	8
L.		Questions, schedule, summary of answers to	19-21
Labor and system of farming	21	R.	
Laborers, best system of farming for	21	Railroad transportation facilities (<i>see</i> county descriptions) ..	11-15
condition and nationality of, and wages paid to ..	21	Rainfall and temperatures of the state	8
owning houses or lands	21	Rating of the staple (<i>see</i> abstracts in county descriptions) ..	12-14
Lands, alluvial, general description of	8, 9	Red lands, timber growth of	9
lying "turned out", proportion of (<i>see</i> abstracts in county descriptions)	12-14	Reference table of reports received	18
market value of	21	Region, areas of each, in counties (<i>see</i> county descriptions) ..	11-15
preparation given to, before planting cotton	19	oak uplands	9
proportion of, in cotton for each soil. (<i>See</i> under Soils.)		tide-water	8, 9
rent paid for and market value of	21	transmontane and valley	9, 10
Letters of transmittal	iii	Regions, agricultural, enumeration of	8
Limestone region	9	Remarks on cotton production in the state	10
Lint per acre in counties (table)	3	Rent paid for land	21
List of correspondents	18	Report, sources of information for this	iii
	646	Reports received from counties, reference table of	18
		Rotation of crops, details of	19
		Rot of bolls, occurrence of, and how obviated	20
		Rust or blight, occurrences of, on heavy or ill-drained soils, in what seasons, and how obviated	20
		S.	
		Sandy oak and pine ridges, general description of	9
		Sea-board or alluvial region, area and description of	8, 9
		Seed-cotton, amount of, required for a 475-pound bale of lint ..	20
		penned, or how protected	20
		product per acre of, and amount required for a bale of lint (<i>see</i> abstracts in county descrip- tions)	11-15

25

647